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Aguayo Gonzalez et al.

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(54) **SYSTEMS, METHODS, AND APPARATUSES FOR INTRUSION DETECTION AND ANALYTICS USING POWER CHARACTERISTICS SUCH AS SIDE-CHANNEL INFORMATION COLLECTION**

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See application file for complete search history.

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(57) **ABSTRACT**

Some embodiments described herein include a system that collects and learns reference side-channel normal activity, process it to reveal key features, compares subsequent collected data and processed data for anomalous behavior, and reports such behavior to a management center where this information is displayed and predefine actions can be executed when anomalous behavior is observed. In some instances, a physical side channel (e.g. and indirect measure of program execution such as power consumption or electromagnetic emissions and other physical signals) can be used to assess the execution status in a processor or digital circuit using an external monitor and detect, with extreme accuracy, when an unauthorized execution has managed to disrupt the normal operation of a target system (e.g., a computer system, etc.).

19 Claims, 19 Drawing Sheets